



U.K. Biobank, Regeneron and GSK Announce Largest Gene Sequencing Initiative on World's Most Detailed Health Database to Improve Drug Discovery and Disease Diagnosis

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TARRYTOWN, N.Y., March 22, 2017 /PRNewswire/ -- Regeneron Pharmaceuticals, Inc. (NASDAQ: **REGN**), today announced a major research initiative among the Regeneron Genetics Center (RGC), U.K. Biobank and GSK to generate genetic sequence data from the 500,000 volunteer participants in the U.K. Biobank resource. The initiative will enable researchers to gain valuable insights to support advances in the development of new medicines for a wide range of serious and life threatening diseases.

Genetic evidence has revolutionized scientific discovery and drug development in recent years by providing clear links between genes and disease. Currently, an estimated 90% of potential medicines entering clinical trials fail to demonstrate the necessary efficacy and safety, and never reach patients. Many of these failures are due to an incomplete understanding of the link between the biological target of a drug and human disease. By contrast, medicines developed with human genetic evidence have had substantially higher success rates and patient care has benefited.

U.K. Biobank is the world's most comprehensive health resource. It has been collecting information and samples from its 500,000 participants for the past ten years, and ensures that data provided to health researchers does not identify them. RGC and GSK have committed an initial investment to enable the sequencing of the first 50,000 samples, to be completed before the end of 2017. Sequencing of U.K. Biobank's samples will be performed at the RGC facility, one of the world's largest human genetics sequencing centers. Sequencing of the full 500,000 samples in U.K. Biobank is expected to take three to five years.

Consistent with the founding principles of U.K. Biobank, these sequence data will be incorporated back into U.K. Biobank's resource following a standard exclusivity period for GSK and Regeneron (9 months for the initial phase) and made openly available to the broader scientific community. Research findings will also be submitted for publication in peer-reviewed journals.

"As a result of the altruism and continued support of our volunteer participants, U.K. Biobank has amassed an enormous amount of securely-stored health, lifestyle, medical and biological data. Genetics research is already shaping better treatments. This exciting initiative is expected to start producing novel findings rapidly during this year and will make U.K. Biobank even more useful for health-related research," said **Sir Rory Collins, U.K. Biobank Principal Investigator and BHF Professor of Medicine & Epidemiology at Oxford University**. "U.K. Government and charity medical research funders have invested about £200 million in U.K. Biobank. The costs of gene sequencing are falling, but doing it on a large scale involves highly-specialized capabilities and is expensive - with an estimated cost of \$150 million if all 500,000 participants are sequenced. That is why academia and industry working together is so important. The initial investment by GSK and Regeneron will be a tremendous boost to the value of the U.K. Biobank resource for academic and industry researchers around the world, studying many different conditions."

The RGC has previously sequenced DNA samples from more than 150,000 individuals and is now sequencing at a rate exceeding 150,000 individuals per year. The center has successfully applied large-scale human genetics to discover new drug targets and validate existing development programs, and has collaborated with more than 35 institutions around the world.

"Our large-scale sequencing and analysis capabilities, coupled with U.K. Biobank's vast trove of de-identified biological and medical information, pose tremendous opportunities for clinically meaningful discoveries that can make a difference for patients," said **George D Yancopoulos, M.D., Ph.D., President and Chief Scientific Officer of Regeneron**. "We have long recognized that advancing the pace and clinical utility of human genetics research requires collaboration and an open exchange of data between industry, academia and public health groups, and we are pleased to expand upon our existing foundational research collaborations through this effort with the U.K. Biobank and GSK. For Regeneron, we believe this initiative will greatly enhance our existing efforts in gene discovery and genetics-guided drug development."

GSK has significant expertise in genomics and is increasingly incorporating the almost daily advances in this scientific field into its drug research programs. A dedicated team of scientists focus on identifying new opportunities for drug discovery based on genetically-validated drug targets, working across the Company's R&D organization, and through major external collaborations. GSK's 'Open Targets' collaboration with the European Bioinformatics Institute, the Wellcome Trust Sanger Institute and Biogen includes an open access research platform, which makes genetic and biological data openly available to support drug discovery. Over 60% of the targets selected for new GSK drug discovery programs in 2016 are supported by human genetic evidence.

"I believe that we are in a new era of drug discovery because of a fundamental change in our understanding of human biology, driven largely by advances in human genetics. U.K. Biobank is one of the most important health resources available to scientists today, offering a rich source of information about health and disease," said **Patrick Vallance, President, R&D at GSK**. "Having been actively involved in U.K. Biobank as a board member since 2013, I'm delighted that, through our collaboration with Regeneron, we can enrich this resource for the wider scientific community and also provide potential new opportunities for companies such as ours to develop new medicines for patients. It demonstrates how important the U.K. is as a center for innovative research. GSK is committed to ensuring that the U.K. continues to be an environment that fosters collaboration and supports end-to-end scientific progress, ranging from cutting-edge genomics to the rapid uptake of new approaches and medicines by the NHS, which can ultimately benefit patients."

About U.K. Biobank

U.K. Biobank is the most comprehensive resource of its kind in the world. Its 500,000 participants have provided information about their health, well-being and lifestyle, as well as blood and other biological samples for long-term storage and analysis. In addition, they have agreed to have their health followed through medical records for many years. Scientists from around the world are able to use the resource for research intended to improve the prevention and treatment of a wide range of common disorders.

U.K. Biobank is funded by the Medical Research Council, Wellcome Trust, Department of Health, Welsh Government, Scottish Government, British Heart Foundation, Cancer Research U.K. and Diabetes U.K.

About GSK

GSK - one of the world's leading research-based pharmaceutical and healthcare companies - is committed to improving the quality of human life by enabling people to do more, feel better and live longer. For further information please visit www.gsk.com.

About the Regeneron Genetics Center

The Regeneron Genetics Center LLC (RGC) is a wholly-owned subsidiary of Regeneron Pharmaceuticals, Inc. The RGC is a fully integrated genomics program that spans early gene discovery and functional genomics and facilitates drug development. The primary goal of the RGC is to improve patient outcomes by identifying novel drug targets, clinical indications for development programs, and genomic biomarkers for pharmacogenomic applications. The RGC has developed capabilities across various sequencing and analytical approaches and has established numerous collaborations with leading human genetics researchers. To enable this large-scale sequencing and analysis program, the RGC utilizes fully-automated sample preparation and data processing, as well as cutting-edge cloud-based informatics. The RGC has sequenced de-identified DNA from more than 150,000 individuals to date and is now sequencing at a rate of greater than 150,000 individuals per year.

About Regeneron Pharmaceuticals, Inc.

Regeneron (NASDAQ: REGN) is a leading science-based biopharmaceutical company that discovers, invents, develops, manufactures and commercializes medicines for the treatment of serious medical conditions. Regeneron commercializes medicines for eye diseases, high LDL cholesterol and a rare inflammatory condition and has product candidates in development in other areas of high unmet medical need, including rheumatoid arthritis, atopic dermatitis, asthma, pain, cancer and infectious diseases. For additional information about the company, please visit www.regeneron.com or follow @Regeneron on Twitter.

Regeneron Forward-Looking Statements and Use of Digital Media

This press release includes forward-looking statements that involve risks and uncertainties relating to future events and the future performance of Regeneron Pharmaceuticals, Inc. ("Regeneron" or the "Company"), and actual events or results may differ materially from these forward-looking statements. Words such as "anticipate," "expect," "intend," "plan," "believe," "seek," "estimate," variations of such words and similar expressions are intended to identify such forward-looking statements, although not all forward-looking statements contain these identifying words. These statements concern, and these risks and uncertainties include, among others, the nature, timing, and possible success and therapeutic applications of Regeneron's products, product candidates, and research and clinical programs now underway or planned, including without limitation the use of human genetics in Regeneron's research; the extent to which the results from Regeneron's research programs (such as the collaboration between the Regeneron Genetics Center, U.K. Biobank and GSK discussed in this news release) or preclinical testing may lead to advancement of product candidates to clinical trials or therapeutic applications; ongoing regulatory obligations and oversight impacting Regeneron's research and clinical programs, marketed products, and business, including those relating to patient privacy and genetic information; unforeseen safety issues resulting from the administration of products and product candidates in patients, including serious complications or side effects in connection with the use of Regeneron's product candidates in clinical trials; the likelihood and timing of possible regulatory approval and commercial launch of Regeneron's late-stage product candidates and new indications for marketed products; determinations by regulatory and administrative governmental authorities which may delay or restrict Regeneron's ability to continue to develop or commercialize Regeneron's products and product candidates; competing drugs and product candidates that may be superior to Regeneron's products and product candidates; uncertainty of market acceptance and commercial success of Regeneron's products and product candidates; the ability of Regeneron to manufacture and manage supply chains for multiple products and product candidates; coverage and reimbursement determinations by third-party payers, including Medicare and Medicaid; unanticipated expenses; the costs of developing, producing, and selling products; the ability of Regeneron to meet any of its sales or other financial projections or guidance and changes to the assumptions underlying those projections or guidance; the potential for any license or collaboration agreement, including Regeneron's agreements with Sanofi and Bayer HealthCare LLC (or their respective affiliated companies, as applicable), to be cancelled or terminated without any further product success; and risks associated with third party intellectual property and pending or future litigation relating thereto. A more complete description of these and other material risks can be found in Regeneron's filings with the U.S. Securities and Exchange Commission, including its Form 10-K for the fiscal year ended December 31, 2016. Any forward-looking statements are made based on management's current beliefs and judgment, and the reader is cautioned not to rely on any forward-looking statements made by Regeneron. Regeneron does not undertake any obligation to update publicly any forward-looking statement, including without limitation any financial projection or guidance, whether as a result of new information, future events, or otherwise.

Regeneron uses its media and investor relations website and social media outlets to publish important information about the Company, including information that may be deemed material to investors. Financial and other information about Regeneron is routinely posted and is accessible on Regeneron's media and investor relations website (<http://newsroom.regeneron.com>) and its Twitter feed (<http://twitter.com/regeneron>).

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